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Control of Foodborne Pathogens in Kofta Using Sumac Extract

Ph.D. Thesis

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Abstract	First part of the study, 30 raw kofta samples collected from different supermarkets in Ismailia city subjected to bacteriological examination as total psychrotrophic, <i>Staphylococcus aureus</i> , Enterobacteriaceae count and isolation and identification of <i>Escherichia coli</i> and salmonella. Results revealed that mean values of total psychrotrophic, <i>Staphylococcus aureus</i> and Enterobacteriaceae count were $2.2 \times 10^5 \pm 6.6 \times 10^4$ cfu/g, $6.2 \times 10^3 \pm 2.4 \times 10^3$ cfu/g and $2 \times 10^4 \pm 3 \times 10^3$ cfu/g, respectively while <i>Escherichia coli</i> detected in 6.67% of samples, identified to O ₁₈ and O ₁₂₅ , and confirmed by cPCR technique. On the other hand, kofta samples were free from salmonella. Second part, examined the effect of sumac spices, Among the tested bacteria. <i>Staphylococcus aureus</i> found to be more sensitive than <i>Escherichia coli</i> . The effect of sumac spices at concentration 1%, 2.5 and 5% (w/v) on total psychrotrophic, <i>Staphylococcus aureus</i> and Enterobacteriaceae count investigated and there were significant differences (P<0.05) found between treated groups with sumac and untreated one. Sumac spice found to be effective against all the tested organisms and decrease microbial load. The extract prolongs the shelf life of kofta and enhances sensory characters.
Key words	Psychrotrophic bacteria-Enterobacteriaceae- <i>Staphylococcus aureus</i> - <i>Escherichia coli</i> -Salmonella-Sumac spice extract

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List of Abbreviations

EOS	Egyptian Organization for Standardization and Quality
WHO	World Health organization
<i>S .aureus</i>	<i>Staphylococcus aureus</i>
<i>E. coli</i>	<i>Escherichia coli</i>
<i>Stx</i>	Shiga toxin gene
<i>PhoA</i>	Alkaline phosphatase gene
ICMSF	International Commission on Microbiological Specification for Food
ISO	International Organization for Standardization
FSIS	Food Safety and Inspection Service
APHA	American Public Health Association
ASTM	American society for testing and materials
cPCR	Conventional Polymerase chain reaction
SPSS	Statistical Package for Social Science
BP	Base pair
GHP	Good hygienic practices
FDA	Food and Drug administration
GHM	Good hygienic manufactures
NCCLS	National Committee for Clinical Laboratory Standards,